East Hampshire District Council
Net zero carbon local plan policy support

Evidence base:
Carbon budget assessment

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Version 2

Bioregional

Written by: Jimin Oh (Analyst) and Marina Goodyear (Senior Sustainability Consultant)
Checked by: Marina Goodyear (Senior Consultant) and Lewis Knight (Director)

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Executive Summary

Bioregional is supporting East Hampshire District Council (EHDC) in preparing a robust evidence base for net zero carbon local plan policy. This carbon budget assessment tests whether the operational energy performance standards applied to *new-build housing* can be demonstrated as necessary for EHDC to remain aligned with the UK's legislated carbon budgets and the national (and local) net zero target of 2050.

Purpose of the report

The assessment combines operational energy performance for representative new homes with a **locally derived carbon budget** (for the operational emissions of new-build housing) that is logically traced from national carbon budgets. Two policy approaches are compared:

- a **TER / Building Regulations-aligned approach**, represented here using **Future Homes Standard (FHS) Option 1** as the "no policy" scenario; and
- a **"True Net Zero EUI" approach**, which corresponds to EHDC's emerging Local Plan Policy CLIM2. This approach uses absolute energy metrics (Energy Use Intensity and Space Heat Demand) and requires on-site renewable generation to match annual energy use, thereby achieving net zero operational emissions from year one.

Key modelling assumptions

- Energy performance is drawn from the Passivhaus Planning Package (PHPP)-based modelling for two archetypes: a semi-detached house and a low-rise apartment block, weighted using an assumed 73% houses / 27% flats split.
- To maintain consistency and comparability across scenarios, PHPP outputs are used for both scenarios, recognising that SAP is a compliance tool and may not reflect real-world energy use accurately.
- The housing trajectory assumes a mid-point delivery of 16,900 dwellings over 2025–2043, with delivery extended (at the same average rate) beyond the plan period to cover the full carbon budget window to 2050, giving an estimated 23,127 dwellings delivered across 2025–2050. The mid-point delivery has been determined as a mid-point between the estimated need for new homes in EHDC's planning area over an 18-year period (per EHDC's Housing & Economic Development Needs Assessment, 2025; c.15,000 dwellings) and a larger requirement (c.18,800 dwellings) that takes account of unmet housing needs from the South Downs National Park and local planning authority areas to the south of East Hampshire (Havant, Portsmouth, Gosport). Due to extremely high unmet housing needs from these areas, the larger requirement has been determined through the Integrated Impact Assessment for the emerging Local Plan as the sum of the highest housing capacities of sites within 'reasonable alternatives' for the development strategy of the emerging Local Plan.
- Homes delivered up to the end of 2026 are assumed to follow Part L 2021 (including gas), with homes from 2027 assumed to be all-electric under FHS / policy scenarios.

Results

The report derives a local carbon budget for EHDC from national carbon budgets to 2050, then apportions this to the housing sector, and finally to the new-build portion of housing emissions. Under this approach, **the available carbon budget for new-build housing operational emissions (2025–2050) is calculated as 43.59 $ktCO_2e$.**

At a per-home level (weighted average), the modelling indicates a step-change between the two approaches:

		Weighted average per new-build home in East Hampshire, reflecting local split of 27% apartments vs 73% houses		
Metric	**Unit**	**Part L 2021 (today)**	**FHS 1 ('no policy' scenario)**	**True net zero EUI (CLIM2)**
Net annual carbon per home in 2025	kg CO_2e/yr	1,194 kg	132 kg	-21 kg

When scaled across cumulative delivery and assessed against the carbon budget, the results show:

- **"No policy" (from 2027):** exceeds the available 43.59 $ktCO_2e$ budget by 3.57kt.
- **True Net Zero EUI (from 2027): delivers a small net negative contribution** (reported as -0.58 $ktCO_2en$) that partially offsets prior emissions.

The core conclusion is that **a Building Regulations / TER-led "no policy" pathway would leave EHDC's new-build housing operational emissions misaligned with the available carbon budget**, indicating clear local circumstances for adopting a more effective approach. The True Net Zero EUI approach is shown to be the most robust and "proactive" policy option, because it is the only scenario that achieves (and can verify) net zero operational outcomes for the homes it influences, helping to counterbalance unavoidable near-term emissions associated with the pre-policy period.

Introduction

Bioregional is supporting East Hampshire District Council (EHDC) and the production of the local plan with evidence on net zero carbon policymaking. This report forms part of that evidence base. This report's purpose is to explore, through reasoned analysis, what local standards for new buildings' energy performance can be demonstrated necessary in order for East Hampshire to remain in line with the national carbon budgets and net zero target date of 2050. This is part of the policy justification as per the NPPF tests of soundness.

This is relevant to fulfilment of the following expectations laid on the local plan:

- The legal duty to mitigate climate change (Planning & Compulsory Purchase Act 2004)
- The NPPF 2024 requirement that this mitigation should entail "radical reductions in [carbon] emissions … in line with the objectives and provisions of the Climate Change Act 2008"
- The expectation that during the pursuit of sustainable development in plan-making, local circumstances should be taken into account (NPPF 2024, paragraph 9).

The Climate Change Act includes the net zero goal and the legislated carbon budgets for the UK (limits on the permissible amount of emissions in each 5 years; see

Figure 1).

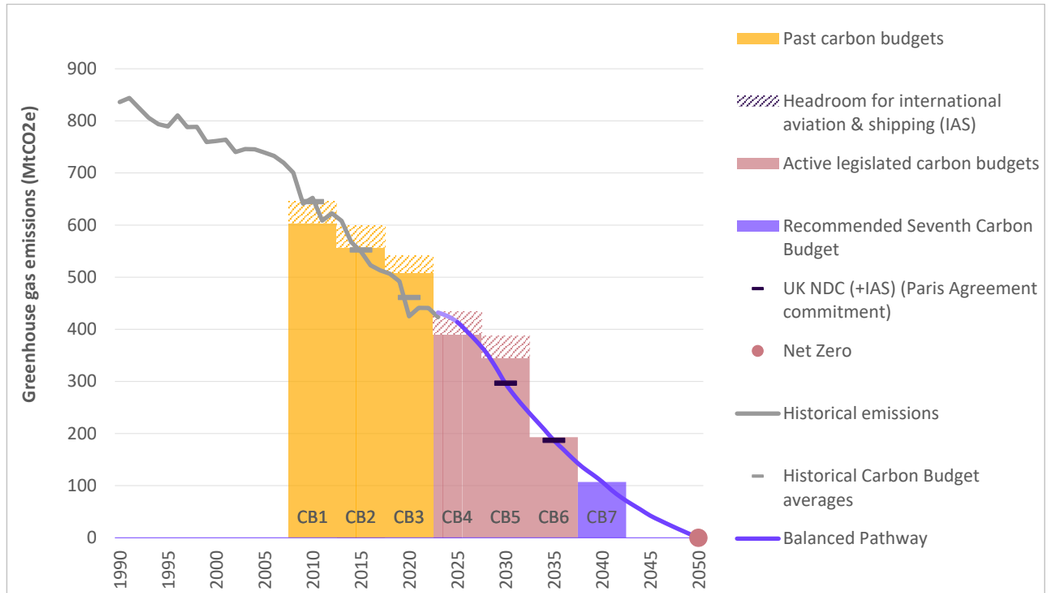


Figure 1: The UK's legislated carbon budgets (past, present and future) within the Climate Change Act. Adapted from: Climate Change Committee, 7th Carbon Budget report, 2025.

This report assesses the carbon impact of two broad types of policy approach:

1. **An approach that is based on the Building Regulations Part L 'TER' metric, expressed as a percentage reduction on Part L 2021 TER calculated via Part L SAP10.2 methodology)**
2. **An approach that is based on the energy efficiency metrics of total Energy Use Intensity (EUI) and space heat demand (SHD) calculated using a more accurate energy modelling methodology, plus renewable energy provision on site sufficient to match total energy use thus reaching 'true net zero' in operation.**

The impetus for this analysis is that the Written Ministerial Statement of 13th December 2023 (WMS2023) purports to stipulate that any local plan energy efficiency standard should be expressed as a % TER reduction via a specific version of SAP. However, industry best practice[1] is to use metrics other than TER; specifically EUI and SHD, using a more accurate methodology than SAP. It is legally established[i] that local plans can diverge from national policy if there are local or exceptional circumstances to justify this. This report explores whether such circumstances are extant in light of the effectiveness of TER-based vs EUI-based standards in keeping EHDC within its proportionate share of national carbon budgets, thus meeting the mandate to 'mitigate climate change in line with the Climate Change Act'.

A further impetus for this report extends beyond the preparation of the Local Plan. EHDC also seeks to establish a local carbon budget for East Hampshire in order to better understand the scale of emissions reductions required to meet the climate emergency commitments set out in its Corporate Strategy. In assessing the carbon implications of the policy approaches for future housing development, this report establishes a local carbon budget for the built environment in East Hampshire (see Section 2). This provides a quantified basis for wider climate action across the district, including the development of an area-wide carbon budgeting approach, the prioritisation of interventions across sectors such as existing housing, transport and energy infrastructure, and the shaping of Local Area Energy Planning and retrofit strategies. It also provides a robust evidence base to support engagement with partners and central government, including in the context of devolution, by demonstrating the scale of emissions reductions required locally. To determine whether local circumstances are demonstrated, this study also establishes a local carbon budget for the specific scope of operational carbon of new build housing in EHDC (derived from the national legislated carbon budgets). This study then models new homes' operational emissions in 2025-2050[2] in three policy scenarios:

- Future Homes Standard (FHS), which is a WMS2023-compliant standard passed into Building Regulations in March 2026 and thus represents the 'no policy' situation;

[1] As endorsed by all major standard-setting professional bodies in the UK construction sector, by their co-creation of the UK Net Zero Carbon Buildings Standard which uses the metrics of EUI, SHD and renewable energy provision

[2]. It is acknowledged that the Local Plan period runs from 2024 to 2045. However, because we already have the data on UK-wide emissions in 2024 (413.67 $MtCO_2e$; CCC's 2025 Progress Report), that amount is deducted from the current national carbon budget before assigning the local share of carbon budgets remaining, and therefore this analysis defines the remaining carbon budget period as starting in 2025 and finishing at the national legislated net zero goal of 2050, as the national carbon budgets will apply all the way to that point.

- “True Net Zero EUI” policy scenario (which represents an approach that diverges from the WMS2023 by using more effective metrics for energy efficiency).

The carbon emissions of these three scenarios draw on prior energy modelling of the performance that would be achieved by typical East Hampshire new homes in those policy scenarios. The number of homes modelled reflects a reasonable response to the housing growth target for EHDC’s plan period housing (to 2043), plus an estimate of the number of homes that would be delivered after the end of the plan period but before the 2050 end date of the UK’s national carbon budgets. The energy performance figures scenario are translated into carbon emissions through to the UK’s legislated net zero goal date of 2050, reflecting national figures for conversion of gas and electricity to emissions including future electrical grid decarbonisation.

Where the carbon budget for new build housing’s operational emissions is exceeded by a policy scenario, this demonstrates that the policy scenario is not aligned with the Climate Change Act goals (and therefore the climate mitigation mandate in law and policy as above). While the Climate Change Act does not legislate emissions limits on individual sectors, the legislated national carbon budgets rely on steep falls in all sectors’ emissionsii (see Figure 2)

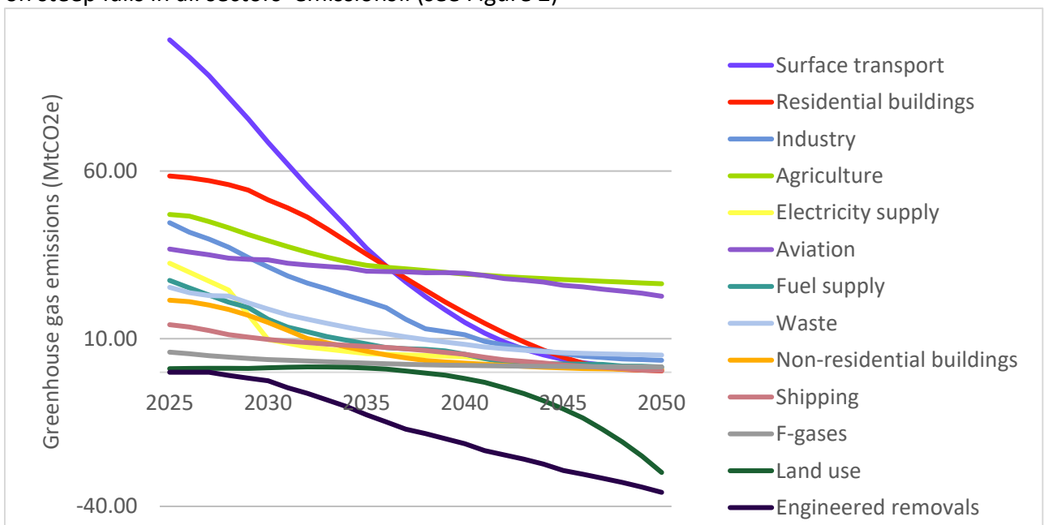


Figure 2, to a level that will be challenging for each sector to achieve even without trying to balance any underperformance by other sectors. It is thus most effective to pursue indicative sectoral carbon budgets to keep the national legislated mitigation target feasible. Therefore, logically, all sectors in East Hampshire will need to stay within their reasonable share of the overall borough-wide carbon budget, in order to meet that climate mitigation mandate while avoiding a situation in which certain sectors must overcompensate for sectors that produce excessive emissions. This is therefore an appropriate and logical test to apply when determining what policies are appropriate for the local plan’s climate mitigation mandate.

The “True Net Zero EUI” policy scenario requires net zero operational emissions for new buildings, using absolute energy metrics, which diverge from the stipulations of the WMS2023 as previously outlined above. This study will consider whether there are local circumstances to justify divergence from the WMS2023 and whether it would be necessary to apply the “True Net Zero EUI” policy scenario for EHDC to deliver its own housing needs as well as some unmet housing needs from other areas, whilst remaining on target to achieve national carbon budgets legislated via the Climate Change Act’

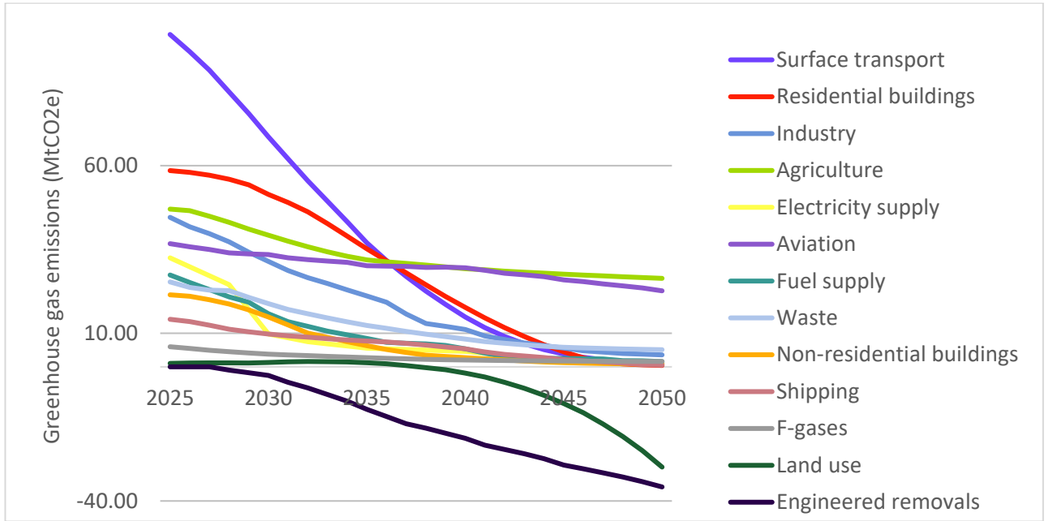


Figure 2: Chart showing how each sector’s emissions must fall in the 'balanced' pathway to net zero in 2050. Adapted from: Climate Change Committee, 7th Carbon Budget report, 2025.

1. Comparison of policy scenarios

Scenarios tested

The first step of this study was to identify energy use data to reflect the situation with the proposed "True Net Zero EUI" policy scenario, versus a no policy scenario. The "True Net Zero EUI" policy scenario corresponds to EHDC's emerging Local Plan Policy CLIM2. This policy scenario represents 'true net zero operational carbon,' requiring that on-site renewable energy generation is equal to total energy consumption and that all of the above are calculated using accurate energy use modelling methods. This is also aligned with industry best practice absolute energy metrics. This energy use would then be converted to carbon emissions, to determine which policy scenario is best aligned to UK's legally binding net zero target and EHDC's local net zero target of 2050.

To represent the emissions of a "no policy" scenario, the Option 1 specification from the Future Homes Standard 2023 consultation was selected. The Future Homes Standard will take effect on March 2027. Although the Future Homes Standard became the new building regulations in March 2026, the consultation version was used for this analysis, as the final version had not been published when the analysis was being undertaken. Government has run two FHS consultations, of which the first (2020) offered only one option and the second (2023) offered two options. The "Option 1" scenario from the second consultation (FHS1), which includes a heat pump and on-site solar PV but only minimal fabric improvement relative to Building Regulations Part L 2021, was considered the more likely outcome at the time this report was written, as it indicated that the new Future Homes Standard would include PV and, in 2023, was the only option to do so.

Secondly, the "True Net Zero EUI" policy scenario was tested. This policy scenario does not wholly align with the requirements of the 2023 WMS because it does not use the Target Emissions Rate metric, but would more effectively optimise energy performance and thus assist fulfilling EHDC's contribution to the UK's legislated carbon budgets and national net zero target of 2050.For the purpose of this study, it is assumed that policy scenarios are delivered entirely on-site and there is no use of offsetting to compensate for a lack of on-site mitigation measures.

FHS and/or TER-based policy option	True Net Zero EUI (CLIM2)
• Target Emissions Rate metric based on % improvement, not absolute values, which makes comparison difficult due to different baselines used • Only considers regulated energy uses (heating, cooling and lighting), not unregulated ones (plug-in appliances) • SAP is a compliance tool and does not accurately model energy use • Cannot be verified during operation to understand potential performance gap between designed and as-built building • Not fit for development of true net zero buildings, due to modelling inaccuracy • Will not deliver net-zero-carbon buildings (until the energy grid is fully decarbonised via future development of extensive standalone renewables).	• Uses absolute energy-based targets that directly limit energy consumption, which are verifiable in-use by the occupier at the meter • EUI accounts for regulated and unregulated energy use • Uses a predictive energy modelling tool (e.g. Passivhaus Planning Package) that is proven to accurately predict energy use, thus reflects real-life performance • Industry-evidenced best-practice to deliver true net zero buildings • Easier to predict impact of design and construction on resident's energy bills • Prioritises renewable energy on-site, rather than assuming that standalone renewable energy schemes will decarbonise the grid.

	FHS Option 1 (no policy)	True Net Zero EUI (CLIM2)
Metrics used	Target Emissions Rate (63% reduction on today's TER) Calculate TER and TFEE with SAP or HEM[3]	Energy Use Intensity (EUI) and space heating demand, via an accurate method
Renewable energy on site (solar PV)	PV area = ~40% of ground floor	Match total energy consumption on an annual basis
Net zero building?	Not until grid is fully zero carbon	Yes, from year 1
Aligned to WMS2023?	Yes	No

[3] SAP will be nationally replaced by the Home Energy Model (HEM) once the Future Homes Standard is in force. Consultation indicates that HEM will retain the TER metric but also offer other outputs.

Establishing the energy use in each of the two policy scenarios

To reflect the energy use in each of the two respective policy scenarios, this analysis uses energy specifications of modelling conducted for a local authority in the close vicinity, given the similarity in climate conditions.

For each archetype, building elements for each policy scenario (see Appendix 'envelope performance' and 'building services' tables) was modelled using a highly accurate energy prediction modelling method (Passive House Planning Package; PHPP[4]) to identify the total energy use of East Hampshire's typical new -build homes in "True Net Zero EUI" policy scenario and the Future Homes Standard.

With the predicted energy use established in each policy scenario, this energy use was then combined with projected grid decarbonisation factors during 2025-2050 (period for EHDC local and national net zero target). The emissions for each policy scenario can then be compared against the available local carbon budget for new build housing, as a share of the national carbon budget (explained later).

The following section focuses on the carbon budget modelling process. For all policy scenarios, the cited energy use data came from energy modelling using PHPP, despite that the FHS1, which is a TER-based, would use SAP in implementation rather than PHPP. This is because if the "True Net Zero EUI" scenario were tested using PHPP, whilst FHS1 were tested using SAP, inconsistency between the modelling tools would result in incomparable figures. Also, SAP is inaccurate at predicting actual energy use[iii,iv,v], whereas PHPP has a track record of accuracy[5]. Instead, the use of PHPP data for all policy scenarios ensures consistent and accurate predictions of energy use (and thus of carbon).

The cited PHPP modelling data includes both regulated and unregulated energy use of each of the home types, giving a detailed picture of home energy use[6]. This carbon budget analysis uses the modelled energy use of two archetypes: an apartment block (11 dwelling units, and a semi-detached house. The same archetypes were used for all policy scenarios. (see Appendix).

[4] PHPP is a modelling tool used to accurately calculate a building's energy use. This is a tool used in the design of Passivhaus buildings, but can also be used as a generic modelling tool in buildings that are not pursuing Passivhaus certification. The tool provides wide functionality through a range of input variables to predict heat loss, energy and broader comfort metrics.

[5] As acknowledged by the industry (e.g. RICS) and also by national government via its 2023 HEM consultation, in which PHPP has been one of the validation tools during the development of that new national model HEM, thanks to PHPP being "regarded as demonstrably accurate for modelling of high-performance homes".

[6] In practice, a 2023 WMS-compliant policy would not assess unregulated energy as the metric it required – Target Emissions Rate – only considers regulated energy. However, homes built under a WMS-compliant policy would still *have* unregulated energy use and associated carbon emissions until the grid is zero carbon.

Energy modelling results per home

		Apartment (one apartment as share of total 9-apartment building)			Semi-detached (one house)		
Metric	**Unit**	**Part L 2021 (today)**	**FHS 1 ('no policy' scenario)**	**True Net Zero EUI (CLIM2)**	**Part L 2021 (today)**	**FHS 1 ('no policy' scenario)**	**True Net Zero EUI (CLIM2)**
Net total energy use per home, after deducting solar PV generation (same in each year)	*kWh/yr*	*5,613 gas* *296 electricity*	*0 gas* *1,326 electricity*	*0 gas* *-136 electricity (entirely onsite)*	*6,899 gas* *-168 electricity*	*0 gas* *891 electricity*	*0 gas* *-173 electricity (usually onsite; some cases may include tiny amount of offsite PV)*
Net annual carbon per home in 2025	kg CO_2e/yr	1,066 kg	174 kg	-18 kg	1,240 kg	117 kg	-23 kg
Total operational carbon emissions per home, in the carbon budget period (2025-2050) if this home is built in Year 1 (2025), with electricity grid decarbonisation[7]	**kg CO_2e/yr**	**26,931 kg**	**1,032 kg**	**-106 kg**	**32,689 kg**	**693 kg**	**-134 kg**

		Weighted average per new-build home in East Hampshire, reflecting local split of 27% apartments vs 73% houses		
Metric	**Unit**	**Part L 2021 (today)**	**FHS 1 ('no policy' scenario)**	**True Net Zero EUI (CLIM2)**
Net total energy use per home, after deducting solar PV generation (same in each year)	kWh/yr	6,555 kWh/year gas -44 kWh/year electricity	0 gas 1,008 kWh/year electricity	0 gas -163 kWh /year electricity
Net annual carbon per home in 2025	kg CO_2e/yr	1,194 kg	132 kg	-21 kg
Total operational carbon emissions per home, in the carbon budget period (2025-2050) if this home is built in Year 1 (2025), with electricity grid decarbonisation	**kg CO_2e/yr**	**31,147 kg**	**784 kg**	**-127 kg**

[7] If grid decarbonisation were slower than assumed, operational emissions would be higher than shown, particularly under the FHS 1 scenario, which remains dependent on the carbon intensity of grid electricity. The True Net Zero EUI scenario would be less affected, as the local plan policy CLIM2 requires on-site renewable generation equivalent to the building's remaining energy demand. As a result, slower grid decarbonisation would be expected to strengthen the relative carbon performance of the True Net Zero EUI scenario.

The above ‘total operational carbon emissions’ take into account the national projection of future decarbonisation of the electricity grid[vi] in the stated carbon budget timescale of 2025-2050.

As expected, FHS1 results in a considerable degree of emissions.

- In the “True Net Zero EUI” policy scenario, the modelling shows that negative emissions are produced from both the houses and the apartment archetype. This is because the policy would require renewable electricity to at least equal annual energy demand. In this scenario, the energy modelling found that in some archetypes the exact amount of energy demand would require in an amount of PV provision that would not be a whole number of standard solar panels. As solar PV provision in practice would have to be a number of whole panels, the provision was rounded up to the next whole panel, and the resulting PV generation from that home becomes slightly more than the building’s actual energy demand. The excess solar PV becomes ‘negative’ consumption as it is exported to the grid (as in apartments and houses at -136kWh and -173kWh respectively as shown above). This means all were able to include enough PV on site to match their energy use in this scenario, but in the event that they could not (e.g. due to site-specific constraints such as overshadowing), this policy would require that exact amount of shortfall to be offset via a contribution to offsite PV provision, thus zero net use and net zero emissions.
- Please note: The apartment block was assumed to be low-rise. If it had more storeys, the final emissions per apartment in the FHS scenario would be even larger, because the extra storeys would increase the energy use, but the PV area would not increase because the PV amount in the FHS is tied to the building footprint area not the height. Thus, the taller the building, the greater improvement the policies make versus the FHS.

Scaling up the per-home results to reflect East Hampshire's total new housing delivery trajectory

To determine the relative contribution from houses[8] and apartment archetypes to the overall new-build housing carbon emissions in East Hampshire, the new-build housing in the plan period is assumed to follow the same split of houses versus apartments that has taken place in recent years in East Hampshire as follows. According to the latest EPC data for new dwellings by housing type, the latest 5 years[9] of data show that 73% of new domestic buildings in East Hampshire were houses, whilst the remaining 27% were flats. In the absence of any reason to depart from this trend, this percentage split is assumed to remain constant for the delivery of new homes from now on.

At the time of undertaking this study, **EHDC's local housing need is estimated as 14,904 dwellings** in accordance with EHDC's HEDNA 2026. When unmet need from neighbouring authorities are considered, the total requirement could rise to 18,800 dwellings in accordance with work undertaken through EHDC's Integrated Impact Assessment for its emerging Local Plan. However, delivery at this upper level is unlikely, as it assumes a density of housing development across all promoted sites that may be inappropriate in practice. It is therefore reasonable to assume that actual delivery will fall between the minimum and maximum scenarios for addressing housing needs. **For the purposes of this carbon budget analysis, a mid-point assumption of 16,900 dwellings has been used for the 2025–2043 plan period**. Even though 2025 has already passed, the most recent available dataset on the existing housing stock, at the time of this analysis, is only available up to 2024. Therefore, dwellings completed from 2025 onwards are treated as new homes for the purposes of this exercise. Since there are 19 years in the period from the first of January 2025 to the end of 2043, this would equate to 889 homes per year[10] in the plan period, assuming a consistent build-out rate. Additionally, as this study needs to cover the total period through to the UK's net zero carbon date of 2050 – which is seven years beyond the end of the plan period – we also assume that this average plan period delivery rate[11] also continues in 2046-2050. This means that if the carbon budget period is 2025-2050 to align with local and national net zero goals, then the total number of new homes built *in the carbon budget period* is 23,127 (of which 16,900 in the plan period).

We assume that as each home is delivered, it is occupied and begins consuming energy in that year[12]. Multiplying the cumulative number of new builds in each year with the energy use per home, we find the assumed total new build stock's energy use in each year of the carbon budget period (2025–2050 as previously noted).

Up to 2026, new homes are assumed to be built to Part L 2021 standards[13] and therefore have gas boilers, resulting in associated operational emissions from gas throughout future years from those homes, as well as their electricity-related emissions. Homes from 2027 onwards are assumed to be all-electric (using electric heating not gas – as this is the specification for the FHS and all policy scenarios). Therefore:

- The total electricity use in each year (by the cumulative number of new homes completed up to that year) is multiplied by the electrical grid carbon factor for that year[14]
- The annual gas use in each year (from the cumulative number of new homes completed up to that year) is multiplied by today's latest available national carbon factor for natural gas use today[vii]. There is no national projection dataset for future gas grid decarbonisation, therefore the same gas carbon factor is used for every year. As previously noted, the only new-build homes that have gas use are those built to Part L 2021 standard (here assumed to apply to all that are built in 2025 and 2026).
- The annual electricity-related emissions and the annual gas-related emissions of all 'new build' homes are summed together to get the operational carbon emissions of the cumulative number of new homes in each year of the carbon budget period. The emissions in each year can then be summed to give the total operational carbon emissions from new builds completed within the carbon budget period.

Period	**Unit**	**No policy (Part L 2021 to end 2026 and FHS thereafter)**	**True Net Zero EUI from 2027 (for homes that are subject to CLIM2)** **(and applicable Building Regulations for homes not affected by new plan policy due to holding prior permissions or applications)**
Total operational carbon emissions from new housing (2025-2050) (kt CO_2e) (Estimated 17,285 new homes delivered in this period, of which 15,862 within the local plan period to 2045) Please note this is made up of:	**ktCO_2e**	**57.93 kt** Of which: • 54.36 kt from Part L 2021 homes • 3.57 kt from FHS homes.	**53.78 kt** Of which: • 54.36 kt from Part L 2021 homes • Minus 0.58 kt from homes meeting 'true net zero' CLIM2.

[9] At the time of conducting the analysis. This national dataset is released quarterly.
[10] The exact number of remaining homes left to deliver in the plan period in fact worked out at 889.47 homes/year. Because it is not possible to have 0.47 of a home in operation, this was smoothed out by entering 890 homes in every second year in the plan period, so that the total number by 2045 remains correct.
[11] Alternating 889 and 890 homes per year to maintain the correct total
[12] This avoids the potential methodological error of assuming all homes are using energy from the first year of the plan period. We recognise that there may also be some cases where newly completed homes may have a period of non-occupation for marketing purposes; however, such incidences should be rare and short if the housing demand is as urgent as stated by industry and government, especially given that significant proportions of new builds are sold before completion. Additionally, in our ultimate comparison of East Hampshire's total carbon emissions against carbon budgets, any unoccupied periods in new builds should be more than balanced out by the fact that the data on local areas' existing carbon emissions has a 2-year data lag and therefore misses out any new builds completed between the most recently published data year (2023 at the time of this analysis) and our carbon budget start date (2026).
[13] This is because the Future Homes Standard will be in force from March 2027.
[14] See

• 7,266 homes that would not be subject to the new policy due to holding existing permission or being subject to an existing application • 10,019 homes that would be subject to the new policy.			

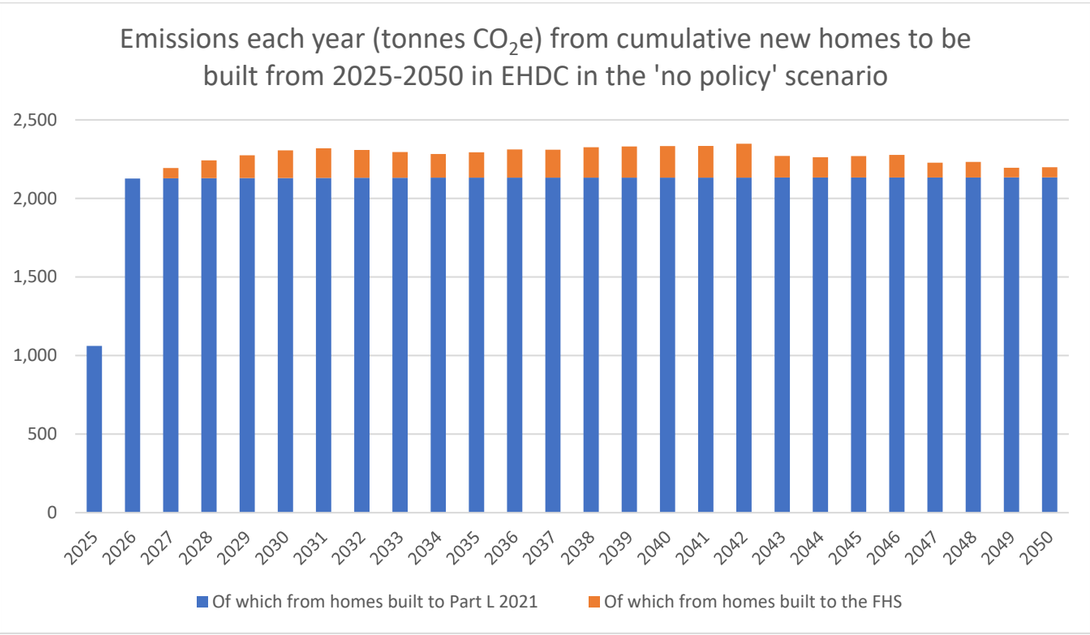


Figure 3: Emissions each year (tonnes CO2e) from cumulative homes that would be completed from 2025 onward (cumulative homes; annual emissions) with the assumed "no policy" scenario (Part L 2021 for homes built up to end of 2026; FHS1 for homes built 2027 onwards).

Figure 3 shows what the annual emissions would be of all new build homes built from 2025 onwards. Dark blue sections represent homes built to Part L 2021 standard (assumed here for all homes built up to end of 2026), while light orange bars represent homes built from 2027 onwards to the FHS. As Part L 2021 has gas heating, this means that the overall emissions are dominated by those Part L 2021 homes despite them only representing 8% of the total new-built homes represented here. This is because the Part L 2021 homes' net energy use is made up of 99% gas use and only 1% net electricity use after deducting the buildings' PV generation. There is no future projection for gas grid decarbonisation, whereas there is for the electricity grid. By contrast, the FHS is all-electric (gas-free). This graph therefore also reveals how grid decarbonisation does significantly reduce emissions of the FHS homes that would have been built up to each year, even though the cumulative number of homes built is increasing each year as previously explained.

However, Figure 4 shows that because the annual emissions figure is not zero even, this **adds up to a significant cumulative amount of emissions in the total national carbon budget period (up to 2050)**. As previously noted, this total emissions from new build homes in the absence of any local policy would reach 57.93 kilotonnes of emissions. Although the Government has described the FHS as "net zero carbon ready" because it is all-electric and will therefore decarbonise along with the grid, the Government's own electricity grid decarbonisation projections used to perform our analysis (see Appendix 2) do not show the grid getting all the way to zero carbon in this period. Although the electricity grid carbon is projected to get very low in the mid-2030s, the **fact that the homes are not zero carbon from day 1** means that their cumulative emissions do add up over time especially as the required housing delivery steadily increases the total number of homes that exist each year.

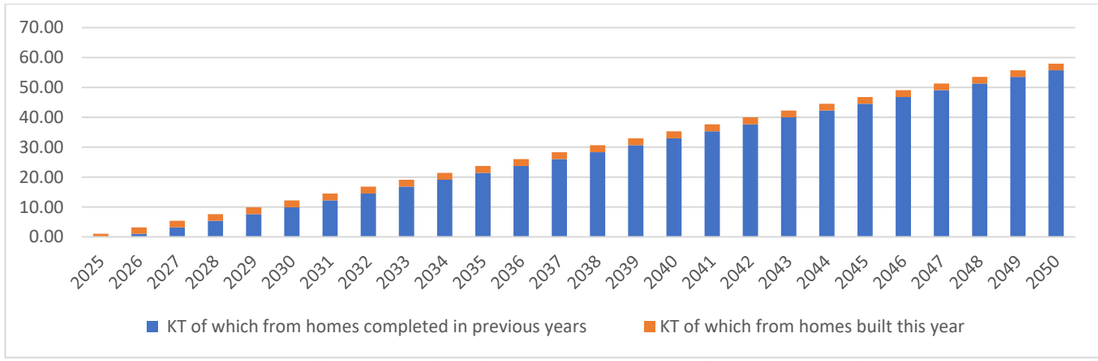


Figure 4: Cumulative emissions to date for each year, from all homes that would be built from 2025 onward (cumulative homes; annual emissions) with the assumed "no policy" scenario (that is, meeting Part L 2021 for builds completed up to end of 2026; and meeting FHS for builds completed thereafter).

In the following section, these cumulative emissions from new housing are compared against the available carbon budget that can reasonably be assigned for new housing in East Hampshire, as a share of national carbon budgets (and eventual net zero 2050 goal) set within the Climate Change Act 2008.

2. Setting a carbon budget for East Hampshire

Importance of setting a carbon budget

The exercises in this section are crucial to determine whether "True Net Zero EUI" policy scenario is necessary for East Hampshire to sufficiently contribute to the legislated national carbon budgets through to the local and national net zero target date of 2050 and stay within its share of the legislated national carbon budget. These are considered the only rational tests for whether the plan will sufficiently fulfil its legal duty to mitigate climate change (set by the Planning & Compulsory Purchase Act 2004) to the extent required by the NPPF 2024 (i.e. proactively and in line with the Climate Change Act), as the Climate Change Act includes the national carbon budgets.

To fulfil the WMS2023's expectation to demonstrate local circumstances to justify the policy, the estimated emissions with and without the "True Net Zero EUI" policy (identified in Section 1) can be compared against what carbon budget is available for the operational emissions of new build homes in East Hampshire, as set by the carbon budget in this section, to align with local and national net zero targets.

By testing these policy scenarios against the available carbon budget, it can be determined whether the "True Net Zero EUI" policy is justified and required for the new housing sector to sufficiently contribute to climate change mitigation. If it is found that the "True Net Zero EUI" policy scenario stays within the carbon budget, while the "no policy" (FHS) scenario fails to do so, this would demonstrate clear local circumstances to justify divergence from the WMS in pursuing the "True Net Zero EUI" policy scenario.

Net zero context for East Hampshire

EHDC declared a climate emergency in 2019 and a target for net zero by 2050, and adopted Climate and Environment Strategy for 2024-2029. For the specific scope of this study (operational emissions of new build housing[15]), it therefore is relevant to consider which policy option would best achieve net zero by 2050 in East Hampshire, as well as the national carbon budgets that define the route towards the national goal of net zero by that same date.

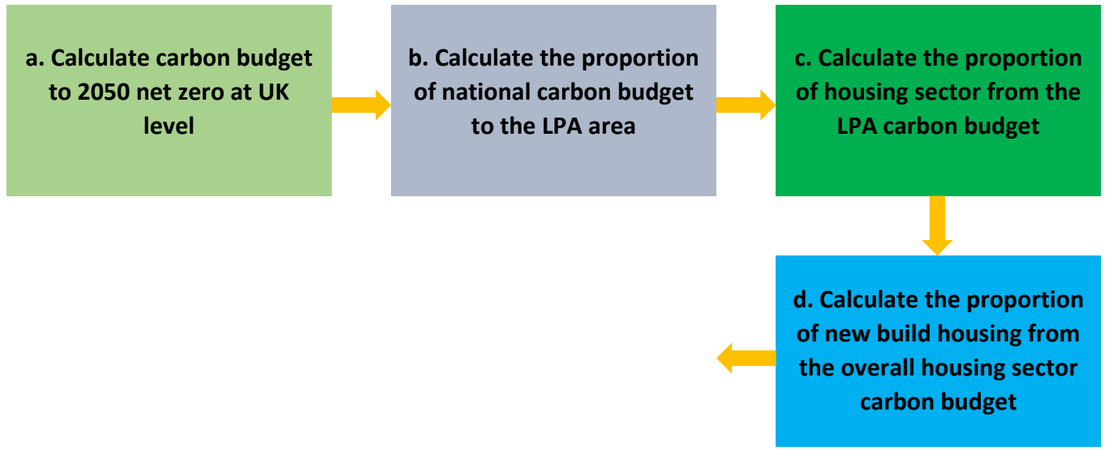
The Balanced Pathway to Net Zero is set out in the 6th Carbon Budget, which is one of the series of legally binding national carbon budgets passed into law under the aegis of the Climate Change Act 2008 that also sets the UK's 2050 net zero goal. The 6th Carbon Budget states that new build homes should be net zero from no later than 2025[viii]. Prior analysis[ix] had shown that this will need to include that new homes achieve a space heating demand of 15-20 kWh/m^2/yr. "True Net Zero EUI" policy scenario requires that all new housing achieves exactly these two points, and is thus aligned with national legislated carbon goals and the local net zero 2050 aspiration. It is crucial that local plans fulfil their mandate to contribute to the national legislated Climate Change Act target of 2050 (and legislated carbon budgets). As per the NPPF (cited above), it is the responsibility of local authorities to ensure their plan *proactively* plays its fair role in this. In local areas that have the viability margin to carry the cost uplift of higher build standards, this would logically mean maximising policy ambitions to balance out for less progressive policies in other areas of the UK that may be less able to meet optimal standards due to local constraints on viability, supply chain or type of development that can be physically accommodated. Testing policies against the national legislated carbon budgets and net zero goal will determine whether the policy is sufficient to proactively mitigate climate change in line with those carbon budgets set via the Climate Change Act.

Carbon budget methodology

The first step in determining whether any of the policy scenarios ("True Net Zero EUI" policy scenario or an "FHS/no policy" scenario) would ensure new build housing is compatible with local or national carbon goals is to rationally establish a specific carbon budget for new build *housing* in this local plan.

The established carbon budget will reflect the local and national net zero 2050 goal. The policy scenarios will be compared against this budget. This local carbon budget does not assume any level of plan policy ambition. Rather, it represents the maximum allowable emissions to align with East Hampshire with the Climate Change Act.

As the WMS2023's specific scope is not relevant to embodied carbon, existing buildings nor non-residential buildings, we here derive local carbon budgets that represent only the maximum allowable emissions for energy use of new build *housing* in East Hampshire.



[15] The 2023 WMS only applies to energy efficiency standards in new build housing (asking that this be expressed in terms of TER, which is operational carbon from regulated energy only) and does not apply to policies on embodied carbon, on-site renewable energy, existing buildings or non-residential buildings. Operational carbon is any carbon emitted during the occupancy of a building. Energy efficiency is using less energy to achieve the desired result (in this case, the desired result is homes that function well for their occupants including remaining a comfortable temperature year-round).

a. Calculating remaining carbon budget to 2050 net zero at UK level

Our first step is to determine to remaining carbon budget to achieving net zero by 2050 at a national level.

We here reflect the actual legislated carbon budget figures where available (all years up to 2037) and the soon-to-be-legislated carbon budget figure for 2038-42 as that has been devised by the Committee on Climate Change and is now with parliament waiting to be legislated.

The actual budget for the 2043-2050 period has not been defined by the CCC and won't be until the 8th Carbon Budget report in a few years. See Appendix 3 for how the figures for 2043-2050 are indicatively derived from the Balanced Pathway trajectory. In short, this reflects Climate Change Committee reports on the Balanced Pathway to Net Zero in 2043-2050, adjusted by the % by which the legislated carbon budgets have historically differed very slightly from the 'Balanced Pathway' figures.

Our resulting overall carbon budget value for the UK to reach net zero by 2050 is therefore 4,588.1 MtCO2e.

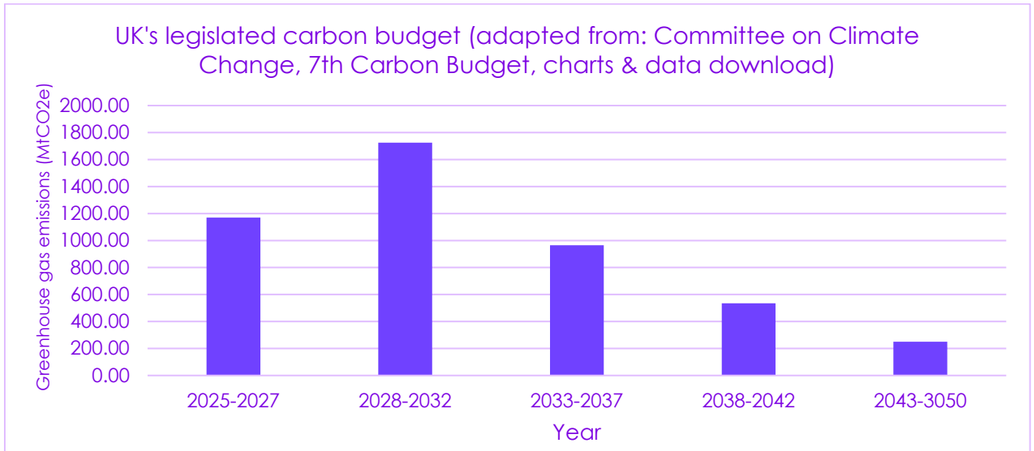


Figure 5. UK's legislated carbon budget (adapted from: Committee on Climate Change, 7th Carbon Budget, charts & data download)

Period	Budget source	Carbon budget ($MtCO_2e$)	Average/yr ($MtCO_2e$/yr)
2025–2027	Remainder of 4th Carbon Budget (2023 to 2027 total = 1,950$MtCO_2e$; actual emissions in 2023+2024 totalled 837. 1950 - 837 = **1,113**)	1,113	390/yr across whole CB; 371/yr in 2025-2027
2028–2032	5th Carbon Budget (legally binding)	1,725	345
2033–2037	6th Carbon Budget (legally binding)	965	193
2038–2042	CCC's 7th Budget recommendation (2025)	535	107
2043–2050	Not officially budgeted, but assume the following based on CCC "Balanced Pathway" annual emissions figures in each year (summing to 250.1 $MtCO_2e$):		
	2043: (65.29 x 103.1%)	67.3	
	2044: (54.07 x 103.1%)	55.7	
	2045: (42.47 x 103.1%)	43.8	
	2046: (33.33 x 103.1%)	34.4	
	2047: (24.58 x 103.1%)	25.3	
	2048: (16.09 x 103.1%)	16.6	
	2049: (7.99 x 103.1%)	8.1	
	2050*: (-1.11 x 103.1%)	-1.14	
Total		**4,588.1**	

On a side note, carbon budgets across the built environment, defined here as emissions directly associated with the buildings and infrastructure that typically comprise these environments, are distributed across residential buildings, non-residential buildings, and surface transport, as shown in Figure 2. While these categories do not represent an exhaustive account of all factors that contribute to the built environment, they capture the principal sources considered by the CCC. For the purposes of

this assessment, the primary focus is on residential buildings, which represent the domestic share of the carbon budget and are subject to the operational and embodied carbon policies set out in the local plan.

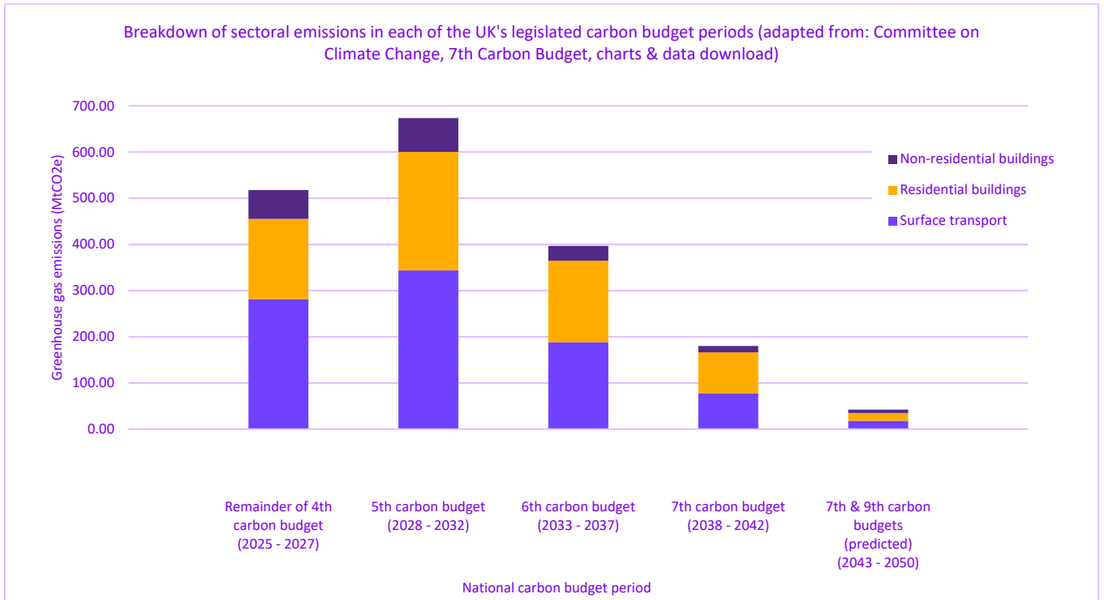


Figure 6. Breakdown of sectoral emissions in each of the UK's legislated carbon budget periods (adopted from: Committee on Climate Change, 7th Carbon Budget, charts & data download)

b. Deriving East Hampshire's share of the total national carbon budget

This next step takes the national carbon budget value and tailors it to an equivalent reduced value for this local area. A reasonable principle is to assume that each local area's respective share of current national emissions will continue into the future[16].

Therefore it is necessary to identify what % this local area's current emissions contribute to current national emissions, using the DESNZ UK Local Authority GHG Emissions dataset (2025 release; 2023 latest emissions values).

For East Hampshire, this calculation is 535.7 $ktCO_2e$ (East Hampshire annual emissions total) divided by 356,094 $ktCO_2e$ (UK annual emissions total) = **0.15%**

0.15% is therefore applied to the national carbon budget value (from the previous stage of this report), to represent the specific carbon budget for East Hampshire. Hence, East Hampshire's carbon budget in 2025-2050 is **6.90 $MtCO_2e$** (0.15% of 4588.1 $MtCO_2e$).

c. Deriving the housing sector's share of the total local carbon budgets

This step apportions a share of the aforementioned total East Hampshire carbon budget to the housing sector in East Hampshire. As per the previous stage, here the housing sector is apportioned a share that reflects the housing sector's existing share of existing total East Hampshire emissions, based on DESNZ UK Local Authority GHG Emissions dataset as previously cited.

To determine the contribution from the housing sector in East Hampshire, an average of emissions from the housing (domestic) sector over the last 10 years is taken, which is representative of the housing sector's contribution to East Hampshire's total emissions over a recent period.

In East Hampshire, 2014-2023 average annual housing emissions were 206.8 $ktCO_2e$, whilst East Hampshire's average annual total emissions were 641.2 $ktCO_2e$. Thus the housing sector contributes 32.2% to East Hampshire's total emissions.

- This 32.2% value is therefore applied to the local carbon budget value from the previous step.
- 6.90$MtCO_2e$ (total local share of national carbon budget value 2025 to 2050) x 32.2% = local carbon budget for housing in 2025 to 2050 is **2,226 $ktCO_2e$**.

d. Deriving new builds' share of the overall housing sector carbon budget

The previous step separated the housing sector from the overall local carbon budget value. The final step to set the local and national carbon budget values for the operational carbon of new build housing is to separate new build housing emissions from existing housing.

Firstly, the expected emissions from existing homes and new build homes throughout the carbon budget period (2025-2050) are calculated.

The % split between the expected emissions of existing homes and new build homes from 2025 to the net zero target date will provide a % split that will be applied to the previous stage's housing sector total carbon budget value. By applying this % split, the value apportioned to new build homes (based on the expected emissions from new homes) forms the final carbon budget value to assess policy scenarios within.

Existing housing

To calculate the expected emissions from existing homes within the carbon budget periods, data from the latest year value for domestic gas and domestic electricity data is used, which is available at the specific East Hampshire level (published in national datasets on local authority area energy use).

The latest available figures on local energy consumption reflect 2024.

[16] This is a principle used by other local carbon budget expert analysis such as that of the Tyndall Centre, termed 'grandfathering'. It more fairly apportions emissions than alternative ways such as by population or financial indicators, because grandfathering automatically takes account of the sectors that make up the economy of each local area. For example, a location with a heavy dependence on employment in manufacturing would struggle to transition to low-carbon as rapidly as a service-based economy, while maintaining employment. Grandfathering automatically factors-in the current economic base of each area by reflecting the existing emissions profile of the area.

In East Hampshire the average 2024 electricity consumption (per existing home, annual) is 4,065 kWh and gas consumption 10,212 kWh (per existing home, annual, domestic standard meters)[17]. Multiplied by East Hampshire's existing housing stock of 56,040 homes[18] this makes 227,796,811kWh of electricity use and 572,292,996kWh of gas use per year across pre-existing housing in East Hampshire from 2025 onwards.

To calculate the cumulative emissions of an average existing home in the carbon budget period, the mean consumption values are multiplied by the relevant carbon factors, using UK Government datasets for electricity (Table 1; Grid average, consumption, domestic) and gas (Fuels tab; natural gas; gross CV) for years 2025-2050**.** The electricity factor includes future grid decarbonisation.

The cumulative emissions for an average existing home in East Hampshire within the carbon budget period (2025-2050) is 51.75 tCO_2e (equivalent to 0.05175$ktCO_2e$).

To determine the expected emissions of all existing homes in East Hampshire within the carbon budget periods, the cumulative emissions of one existing home must be multiplied by the amount of existing homes in East Hampshire. Ministry of Housing, Communities and Local Government 2025 data shows that there are 56,040 homes in East Hampshire. Therefore:

- Carbon budget period (2025-2050): 56,040 x 0.0518 $ktCO_2e$ = 2,900 $ktCO_2e$.

Crucially, this reveals that the predicted **emissions from existing housing already exceed the available East Hampshire housing sector carbon budget** previously identified, by 30%:

Taken at face value, this would imply that there is no room in the carbon budget for any new homes. However, these figures do not assume any future changes to existing homes, e.g. energy efficiency or switching from gas to electric heating. Realistically it is likely this will occur to some extent. Therefore, the next step allocates a share of carbon budget to *new* homes by dividing the available housing sector carbon budget between existing and new homes in proportion to what their predicted emissions would be in the absence of policy. In effect, this allocation of the available budget between the existing and new housing essentially assumes that they together *will* fit within the housing sector carbon budget. This has the effect of assuming that both the pre-2025 and post-2025 homes will undergo some degree of future improvement versus the current emissions profile, especially in pre-2025 existing housing (well beyond the electricity grid decarbonisation that has already been factored into the predicted emissions), to make room in the budget for the emissions of new homes. This is a reasonable assumption to make in East Hampshire as it is underpinned by an objective of the District Council's Climate and Environment Strategy 2024-2029: to make new and existing homes in East Hampshire as energy efficient as possible.

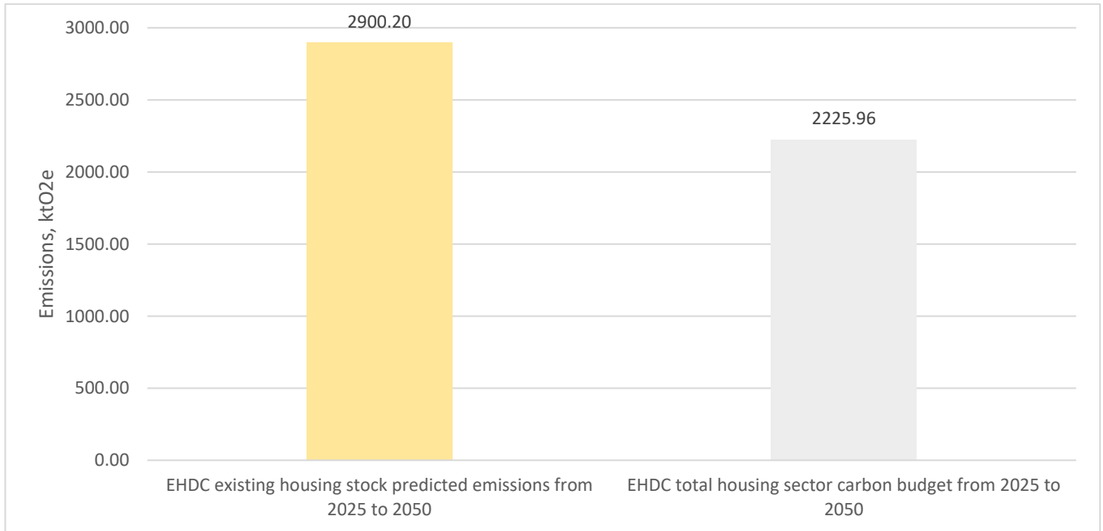


Figure 7: Comparison between predicted emissions of existing homes and total housing sector carbon budget in East Hampshire from 2025 to 2050

[17] Per-home figures derived by dividing the East Hampshire 2024 total domestic gas and total domestic electricity use by the number of homes in East Hampshire in 2024 from MHCLG live tables on housing stock.

[18] This figure is from the MHCLG live data on housing stock for 2024. The MHCLG figures are a snapshot at March of each year, therefore most of the new housing delivery in 2024 would not have been captured in that total housing stock 2024 figure. Nonetheless, we use this as a baseline figure used in the LHNA, all of the subsequent housing growth targets for East Hampshire are *on top of* that baseline, therefore all of East Hampshire's local plan housing growth targets can be counted as additional to that figure.

New build housing

To determine the cumulative expected emissions of all new build homes, FHS Option 1 specification (as explored in the previous section) is assumed as the standard that new homes would be built to as a business-as-usual-scenario (i.e. in the absence of any local plan policy on energy / carbon performance). The weighted average figure from the two archetypes, low-rise flats and semi-detached houses (as mentioned previously), are reflective of an average new build home in East Hampshire over the carbon budget periods, based on what is known about the typical split of housing types in East Hampshire. As previously described, based on housing growth values from 2025 onwards, the following cumulative emissions for all new build homes in East Hampshire from 2025 are calculated as:

- Within carbon budget period to the net zero target date (2025-2050): 57.93ktCO_2e

Balance between existing and new build homes

Adding together the aforementioned *existing homes cumulative emissions* over the respective carbon budget period to that of new homes, this gives a total of:

- Within carbon budget period to local and national net zero target date (2025-2050):
  - 2,900.20 ktCO_2e (existing homes) + 57.93 ktCO_2e (new homes) = 2,958.13 ktCO_2e

Based on the cumulative emission calculations for new build and existing homes for both carbon budget periods, the % contribution to from **new build housing** to overall expected housing sector emissions in the 2025-2050 carbon budget period are:

- From new build housing: 57.93 / 2,958.13 = 1.96%
- From existing housing: 2,900.20 / 2,958.13 = 98.04%

As previously mentioned, the assumption is made that room must be made in the carbon budget to allow for the new housing growth (i.e. that existing housing in East Hampshire will not be allowed to exceed the available local housing sector carbon budget and therefore will undergo some sort of carbon performance improvement in future years). We allocate that room for new housing based on new homes' % of actual predicted emissions, as above.

Applying this % contribution to the previously identified housing sector carbon budget values therefore results in final carbon budgets for new housing as follows:

- **Within carbon budget period to local net zero target date (2025-2050):**
  - **2,226** ktCO_2e (total East Hampshire housing sector) x 1.96% = **43.59 ktCO_2e**

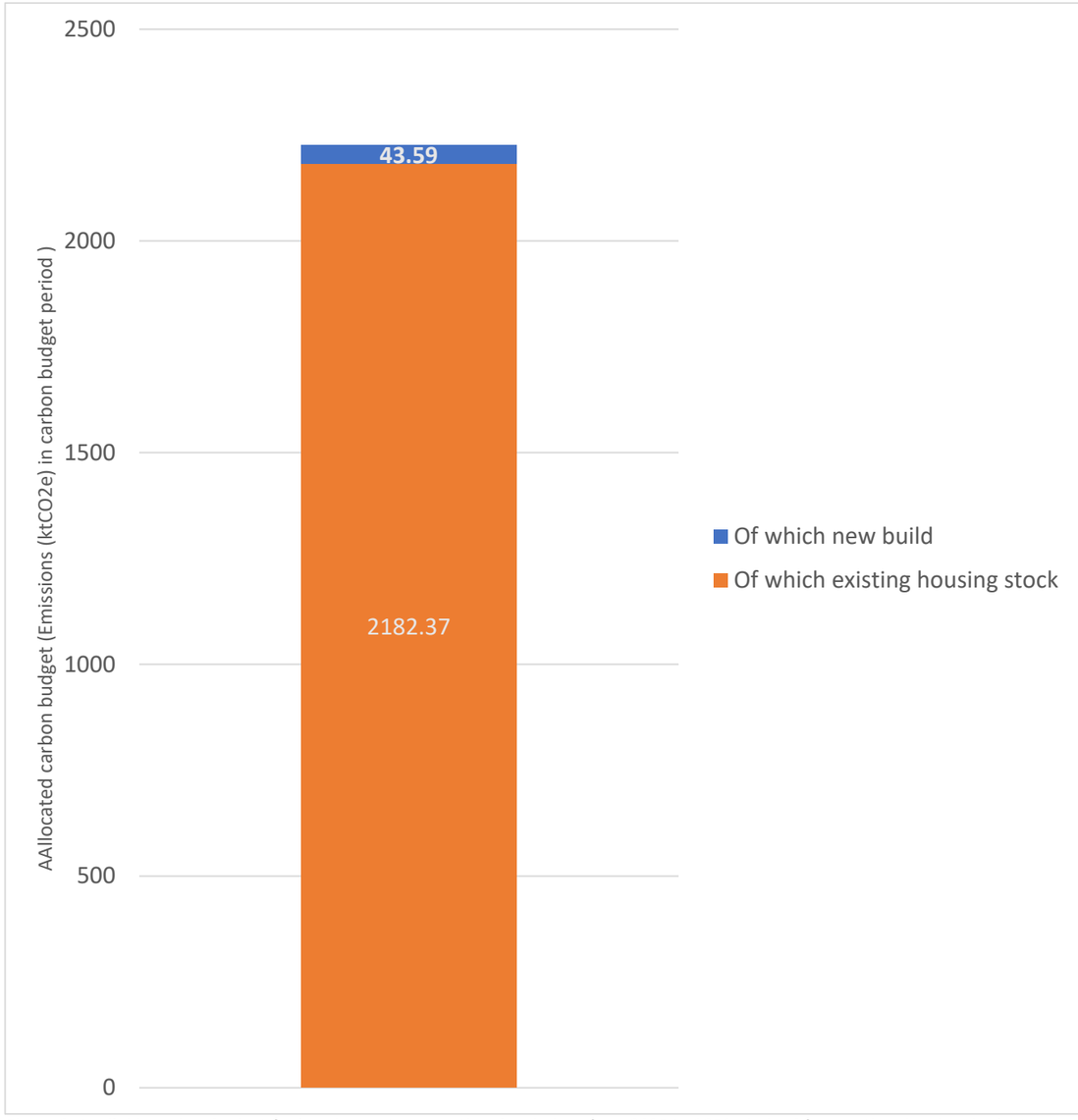


Figure 8: Available carbon budget for housing sector operational emissions from 2025 to 2050, derived from national carbon budgets as previously described.

3. Conclusion to determine alignment with net zero targets

The aim of this report has been to determine whether either of the two policy approaches, "no policy" scenario, "True Net Zero EUI" policy approach (as in CLIM2), would keep new homes within the remaining carbon budget for new build housing in East Hampshire:

- The figures for the 2050 end date are crucial to the question of whether each policy scenario will ensure that housing development in East Hampshire will "contribute to the mitigation of climate change" as per local plan's legal duty, to the extent of being consistent with the national policy instruction to do so "proactively … in line with the Climate Change Act" and "support the transition to net zero by 2050".
- These figures provide an illustration of local circumstances that further justify policy going beyond Building Regulations.

Impact of homes built under "No policy" scenario (From 2027 onwards)	Impact of homes built under True Net Zero EUI policy (as in CLIM2 from 2027 onwards)
3.57kt	-0.58kt

As previously noted, draft proposed "True Net Zero EUI" policy scenario results in the lowest increase in total operational carbon emissions from new housing within the carbon budget period. It is important to note that there is negative total carbon emissions from new housing built after 2027 in the "True net zero EUI" scenario, as the policy represents true zero carbon development and therefore is best aligned to the required carbon budget. The policy achieves this by ensuring that a home is extremely energy efficient to the point that its annual on-site renewable electricity generation meets or exceeds the *total* annual energy use. Key elements of this policy are energy efficiency metrics that cover the home's *total* energy use (not just the regulated energy use[19]) and that are demonstrated using accurate energy use prediction methods (PHPP, CIBSE TM54 or similar[20]).

These key elements for success are precisely what diverges from the Written Ministerial Statement 2023, previously outlined.

In summary: The True Net Zero EUI policy is the only policy that has even a slight negative emissions effect in the carbon budget period (although small), therefore is the only one that contributes to counteract the locked-in excess emissions that will occur from the Part L 2021 homes built in the period before the local plan policy could take effect. **The True Net Zero EUI policy is therefore demonstrated to be the only policy option that 'proactively' mitigates climate change and helps deliver the objectives of the Climate Change Act as instructed by the NPPF and helps fulfil the local plan's legal duty to mitigate climate change.**

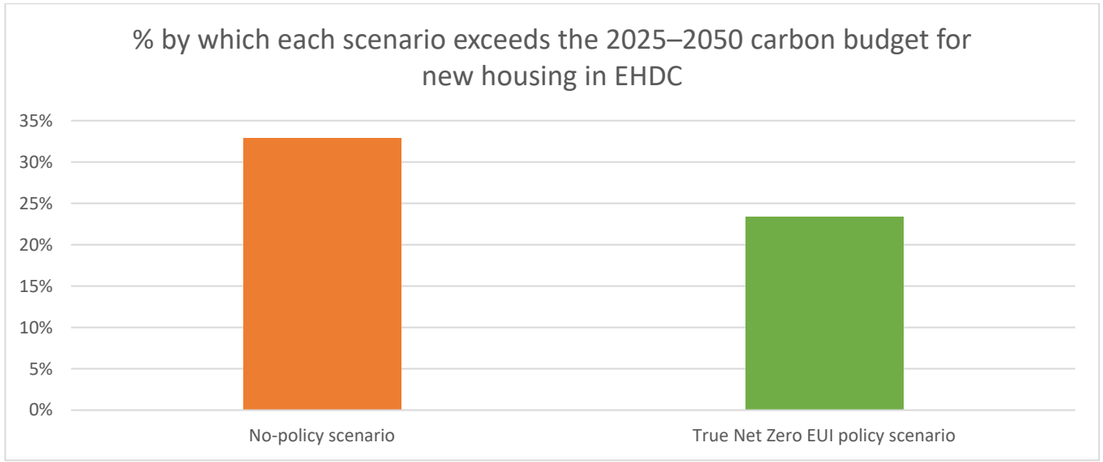


Figure 9: Chart showing percentages by which two scenarios exceed the new housing carbon budget during the carbon budget period (2025-2050).

The "no policy" pathway would exceed the carbon budget available for new housing in East Hampshire by a substantial margin, confirming that relying on Building Regulations and a TER-led approach is not sufficient to keep new-build emissions aligned with the area's remaining carbon envelope. While all scenarios remain above budget overall, this is driven by **locked-in emissions from homes built to Part L 2021 up to the end of 2026**, which is a pre-policy period that is largely unavoidable within the scope of this assessment.

Against this backdrop, the policy comparison is clear. **TER-based approaches continue to add operational emissions throughout the plan period and beyond**, leaving EHDC further from carbon-budget alignment. By contrast, **the True Net Zero EUI approach (as in CLIM2) is the only option that delivers net zero operational performance for the homes it influences and is therefore the only pathway that actively counterbalances the pre-2027 emissions legacy.** In the modelling, the True Net Zero EUI scenario achieves a small **net negative** contribution (driven by on-site renewable generation meeting or marginally exceeding demand in one archetype), which partially offsets the unavoidable emissions associated with Part L 2021 delivery. In other words, it is the only policy option that reverses the direction of travel, moving from continued emissions accumulation to proactive mitigation.

On this basis, a TER-based "no policy" approach cannot be considered an appropriate strategy for meeting the Local Plan's mandate to proactively mitigate climate change in line with the UK's carbon

[19] This is in contrast to the TER metric stipulated by the Written Ministerial Statement 2023 as previously noted. The TER metric by definition can only account for regulated energy uses, which make up only approximately 25-75% of a building's total energy use, depending on type of building.

[20] Again, this is in contrast to the WMS' preferred metric of TER calculated using Building Regulations SAP methodology, which is highly inaccurate in predicting actual energy performance (see separate full evidence report for the extent of SAP's inaccuracy).

budget framework. The analysis indicates that a True Net Zero EUI policy is the only credible and effective option for bringing new housing delivery into the closest possible alignment with the available carbon budget, particularly given the constrained ability to avoid emissions prior to 2027.

Discussion

Clearly, this study has not attempted to test every possible formulation of 2023 WMS-compliant policy scenario. It may be possible to design a WMS-compliant policy that makes some extent more carbon savings than shown here. However, the WMS stipulates the use of a metric (TER, calculated by SAP methodology) that by definition does not cover the total energy use of a home and does not accurately reflect homes' actual energy performance.

Therefore any WMS-compliant policy cannot ensure that homes' energy use is kept low enough that it can be met with on-site renewable energy in actual operation and therefore achieve the actual net zero carbon homes that are necessary for the achievement of national carbon budgets - at least without needing to specify excessive amounts of onsite solar PV provision to counteract SAP's dramatic underestimation of energy use, which could make housing delivery unviable and might not be compatible with electricity grid constraints in some areas. By contrast, the "True Net Zero EUI" policy scenario keeps energy use so low that only small amounts of solar panels on site are needed to match (and even slightly exceed) the home's annual energy use, therefore not bringing excessive construction costs and minimising the burden that these new homes will place on the electrical grid.

Additionally, we reiterate that **the carbon budget assumed 'available' to new homes in this study depends on significant reductions in the emissions of existing homes, beyond what will be delivered by electricity grid decarbonisation.** It is important to focus on the fact that all the expected emissions from existing buildings significantly exceed the overall housing (existing and new build) carbon budget values in East Hampshire.

- Those reductions will need to be delivered by significant rollout of energy efficiency improvements and electric heating (ideally heat pumps) to replace existing homes' gas boilers.
- This change in existing housing is in fact a very uncertain prospect, with the latest national progress report showing that the rollout of insulation and clean heating to existing buildings is far behind where it needs to be for the achievement of nationally legislated carbon targets under the Climate Change Act.
- **If that rollout of improvements to existing housing in** East Hampshire **does not occur**, there will be no space for new homes available in the housing sector carbon budget, and in fact that housing sector carbon budget will be exceeded even just by the emissions of existing homes in the carbon budget period as follows:
    - Overall East Hampshire housing carbon budget of 10,592 $ktCO_2e$ will be exceeded by 3,325 $ktCO_2e$ just by the emissions of the existing housing stock without retrofit.

We reiterate also that **these housing sector carbon budgets are derived directly from the legislated national carbon budgets** via a logical series of steps previously described in sections 2.a – 2.d, this is untenable in light of the local plan's mandate to mitigate climate change in line with the objectives of the Climate Change Act. While these changes to existing buildings cannot be ensured by the local plan (which only exerts power where permission is needed, and cannot force change to happen in existing buildings), it is the responsibility of the local plan to proactively take the mitigation actions that are within its power to reduce the likelihood of these carbon budgets being breached as shown here.

Given that East Hampshire's existing housing emissions are unlikely to remain within the available carbon budget for the entire housing sector in East Hampshire, it is essential that new build housing adds minimal burden to remaining within the budget. It is arguably sensical that a carbon budget of zero should be apportioned to new build housing since the existing housing subsector is already expected to use up all the whole housing sector carbon budget for both local and national periods.

Local plan policy must therefore require robust targets and metrics that truly result in nearly zero carbon development, as the "True Net Zero EUI" policy scenario would achieve. This is currently not achievable under a 2023 WMS-compliant policy, such as one relying on the FHS, as the Target Emissions Rate in the Standard Assessment Procedure (sought by the WMS) ignores unregulated energy which can account for approximately 25-75% of operational carbon emissions in new buildings. The modelling found that Future Homes Standard[21] resulted in residual emissions from new build housing which resulted in a 30% exceedance of the available carbon budget for new housing, whilst the "True Net Zero EUI" policy scenario contributed less than zero emissions in the buildings that would be affected by the policy, which – even after the unavoidable emissions of homes that would be built to Part L 2021 before the policy is in place – results in overall much lower emissions from new build housing compared to any of the other policy scenarios.

It is therefore explicitly apparent that new build housing must be subject to stringent policy that genuinely achieves zero carbon development in the buildings that it can influence, in order to meet the local plan's climate mitigation mandate to the extent required by the NPPF. Expressing a policy in the way that the WMS2023 stipulates – i.e. as a percentage reduction on the TER metric calculated using SAP – would make the policy subject to the inadequacies and inaccuracies of Building Regulations metrics and SAP tool (see separate full evidence base report). This clearly cannot be risked in light of the carbon budget analysis presented here. This study has clearly shown that the modelled WMS-compliant policy ("no policy" scenario is not appropriate to be aligned with East Hampshire's local net zero target nor with the UK's legally binding targets. It is only the "True Net Zero EUI" policy scenario that can be considered appropriate as a proactive mitigation step in line with the net zero targets.

Thus, this study has clearly shown that local circumstances exist to justify a departure from national policy, i.e. the 2023 WMS, as East Hampshire would exceed its remaining carbon budget for new build housing by a significant amount if a policy aligned to the 2023 WMS was implemented, whilst "True Net Zero EUI" policy scenario would contribute towards the mitigation needed in the housing sector.

[21] It is also important to keep in mind that this modelling reflects Future Homes Standard Option 1, which was the more stringent of the two FHS options consulted upon by government (2023 consultation) and in fact the actual FHS that eventually forms the new Building Regulations Part L may even have worse carbon emissions than this.

Appendix 1: Building specifications assumed in each of the three policy scenarios

These building specifications are taken from the primary energy modelling exercise for a local authority in vicinity, which identified what specifications would be needed in East Hampshire to achieve the selected energy performance targets in the policy for homes. These inputs represent different specifications set for different policy scenarios, which are the key factors that influence space heating demand, energy consumption, energy generation and resulting carbon emissions of buildings.

We here provide an extract of apartments and semi-detached houses to illustrate the range of difference between the specifications.

Envelope performance

	FHS Option 1	**"True net zero" EUI-based policy**	
Building element		**Semi-detached**	**Apartment**
Roof U-value (W/(m^2.K))	0.11	0.10	0.10
External wall U-value (W/(m^2.K))	0.18	0.13	0.15
Floor U-value (W/(m^2.K))	0.13	0.10	0.10
Door U-value (W/(m^2.K))	1.00	1.00	1.00
Glazing U-value (W/(m^2.K))	1.20 (Double glazing)	~0.90 (Triple Glazing)	~0.90 (Triple Glazing)
Air permeability	5 m^3/(m^{2}h)	0.6 ACH or 0.57 m^3/(h.m^2)	0.6 ACH or 1.06 m^3/(h.m^2)

Building services

	FHS Option 1		**"True net zero" EUI-based policy**	
	Semi-Detached	**Apartment**	**Semi- detached**	**Apartment**
Heat source	Air Source Heat Pump (ASHP)			
Ventilation	Decentralised Mechanical Vent (dMEV)		Mechanical Ventilation And Heat Recovery (MVHR)	
Renewable energy (PV)	40% GFA/4.5 (kW)	To match demand	40% GFA/4.5 (kW)	To match demand

Appendix 2: Electricity carbon factor change over time

Electricity carbon factors were taken from national projections that are released within the UK Government DESNZ dataset "Green Book Valuation of Energy Use and Greenhouse Gas Emissions for Appraisal"[x], data tables 1-19. The relevant table is "Table 1: Electricity emissions factors to 2100, $kgCO_2e/kWh$".

This is the national estimate of the amount of greenhouse gas emissions that will occur due to each kilowatt-hour of grid electricity use. It reduces over time because national government assumes that more and more renewable energy generation will be connected to the grid to replace fossil fuels, and some extent of hydrogen use and/or carbon capture being deployed at any remaining power stations that run on fossil gas or other combustible fuels.

The Green Book dataset is updated periodically. This analysis was conducted in February 2026, at which time the most recent version was released in November 2023.

The Green Book provides the Table 1 data in 2 forms:

- "Long run marginal" and
- "Grid average".

These two forms are further differentiated into:

- generation-based factors
- consumption-based factors, which are further differentiated by:
    - residential,
    - industrial,
    - commercial/public sector.

The guidance within that Green Book data table download confirms that "Analysts should use consumption-based emissions factors for measuring GHG emissions per unit of final energy demand. These emissions factors include transmission and distribution losses, including significant losses due to power station inefficiency. Long-run marginal emissions factors should be used for measuring small changes in consumption or generation [whereas by contrast,] Grid average emissions factors are used for footprinting."

Therefore, as we are looking to find the carbon footprint of new housing in East Hampshire, for our exercise the **appropriate category is 'grid average, consumption-based, domestic'**.

We therefore here reproduce the relevant part of Green Book Table 1 that we used.

Year	$kgCO_2e$ per kWh Electricity use (Grid average, consumption-based, domestic)
2025	0.131
2026	0.098
2027	0.073
2028	0.063
2029	0.054
2030	0.049
2031	0.042
2032	0.033
2033	0.026
2034	0.021
2035	0.020
2036	0.020
2037	0.018
2038	0.018
2039	0.017
2040	0.016
2041	0.015
2042	0.015
2043	0.009
2044	0.008
2045	0.008
2046	0.008
2047	0.005
2048	0.005
2049	0.003
2050	0.003

Table 1: Relevant grid electricity carbon factors extracted from national Green Book dataset.

Appendix 3: Forecasting an estimated carbon budget amount for years beyond the legislated and CCC-recommended budgets to date

The ultimate carbon budget for East Hampshire needed to be derived from national carbon budgets. National carbon budgets are devised by the Climate Change Committee CCC) before being passed into law by parliament under the aegis of the Climate Change Act.

So far national carbon budgets have only been legislated up to year 2037 (the Sixth Carbon Budget), and the next carbon budget (period 2038-2042) has been devised by the CCC and is now waiting to be passed into law (it is here assumed that this will form the next legislated budget, as prior carbon budgets have followed the CCC's recommendation).

Because the NPPF 2024 instructs local plans to support the *transition to net zero* for which the date is 2050, the carbon budget in this exercise needs to cover the full period to 2050. Therefore for years from 2043 to 2050, it is necessary to make a reasonable assumption about what the carbon budget is likely to be in that period.

The last few CCC recommended budgets (which became law) closely follow what the CCC terms the "Balanced Pathway to Net Zero", which represents the most reasonable balance between ambition and feasibility.

The CCC *does* provide projections of this Balanced Pathway all the way through to the legislated net zero target date of 2050, including beyond the period for which national carbon budgets have been devised so far. The latest available version of this, from the CCC's 7th Carbon Budget Report, is as follows:

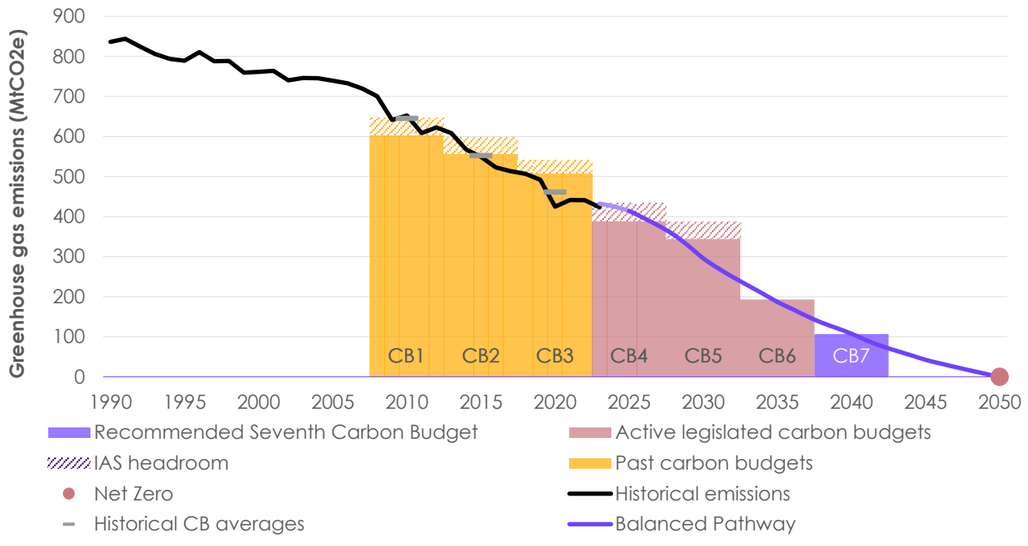


Figure 10: Legislated carbon budgets, soon-to-be-legislated 7th carbon budget, and 'balanced pathway to net zero'. "CB" = Carbon Budget. IAS = International aviation & shipping. Climate Change Committee 7th Carbon Budget, 2025

The CCC's carbon budget reports also come with downloadable spreadsheets of the data that generates these charts. From that download, we can see that the exact emissions in the Balanced Pathway in the years beyond the 7th carbon budget are, in megatonnes CO_2e:

2043	2044	2045	2046	2047	2048	2049	2050
65.29	54.07	42.47	33.33	24.58	16.09	7.90	-1.11

The sum of these is **242.61 $MtCO_2e$**.

We make the assumption that this will be the legislated carbon budget in those years.

However, the CCC's data also show the balanced pathway for previous years and the actual legislated carbon budgets (and soon-to-be-legislated 7th carbon budget). In fact, these do not precisely equal the sum of the 'balanced pathway' annual emissions for the respective years in the period. As a whole, the sum of all actual carbon budgets from today onwards is 3.1% higher than the sum of all 'balanced pathway' annual emissions figures in the same period:

-	**Total $MtCO_2e$, 2023 (beginning of the 4th Carbon Budget period) to 2042 (end of the 7th Carbon Budget period)**
Sum of all "Balanced Pathway" annual emissions:	5,019.3
Sum of all actual national carbon budgets: *(including the 7th carbon budget and minus a deduction from the 4th carbon budget to exclude 2023 & 2024)*	**5,175.0**
Actual national carbon budgets total as a % of 'Balanced Pathway' total	**103.1%**

Therefore, a more accurate prediction of actual carbon budgets from 2043-2050 can be made by applying this difference to the Balanced Pathway figure for that period as noted above:

- **242.61 $MtCO_2e$** x **103.1%** = **250.1 $MtCO_2e$**.

This figure of **250.1 $MtCO_2e$** is therefore the figure we use in our assumptions of the total national carbon budget through to the final net zero legislated date of 2050:

- 4404.5 (budget 2025 to 2042) + **256.2** (budget 2043 to 2050) = **4588.1 $MtCO_2e$**.

All of our local and sectoral carbon budgets are subsequently derive from this national figure.

References & endnotes

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[ii] https://www.theccc.org.uk/wp-content/uploads/2025/02/The-Seventh-Carbon-Budget.pdf. For a view of the past, current legislated and soon-to-be-legislated carbon budgets, see figure 3.2 on page 64. For a view of the steep reductions pathway in each sector, see figure 3.6 on page 72.

[iii] CIBSE (no date), *Carbon Bites: The Performance Gap*. https://www.cibse.org/media/a1skdgsi/cb11.pdf

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[v] RICS (2024), *Whole life carbon assessment for the built environment*. For direction on what energy modelling methods are acceptably accurate, in particular that Part L 2021 calculations (i.e. SAP and SBEM) are not, see section '5.3.1 Energy modelling for buildings', page 103. https://www.rics.org/content/dam/ricsglobal/documents/standards/Whole_life_carbon_assessment_PS_Sept23.pdf#page=103#page=103

[vi] Electricity grid carbon intensity national projections through to 2100 found in HM Government Department for Energy Security and Net Zero (2023*), Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal*, Data table 1. https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal

[vii] HM Government Department for Energy Security and Net Zero (2025), *Greenhouse gas reporting: conversion factors 2025*. Gas usage carbon factor used: Conversion factors 2025: full set (for advanced users); tab "Fuels", category "Gaseous fuels", item "natural gas". https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2025

[viii] Climate Change Committee (2020), *The Sixth Carbon Budget: The UK's path to Net Zero.* See table 3.2.c https://www.theccc.org.uk/wp-content/uploads/2020/12/The-Sixth-Carbon-Budget-The-UKs-path-to-Net-Zero.pdf

[ix] Climate Change Committee (2019) UK Housing: Fit for the future?. *https://www.theccc.org.uk/publication/uk-housing-fit-for-the-future/*

[x] HM Government Department for Energy Security and Net Zero, *Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal*. https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal